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Filed : January 23, 2004

REMARKS

Claim 10 has been amended to clarify the subject matter recited therein. Support for the term "a dome-shaped surface" can be found in the last paragraph on page 9 and Figs. 1 and 3, for example. The amendments have added no new matter to the disclosure. Applicant respectfully requests entry of the amendments and reconsideration of the application in view of the following remarks.

Rejections of Claims 10-11 and 18-21 Under 35 U.S.C. § 103

Claims 10-11 and 18-21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanikawa (USP 5,651,574) and in view of Kiefersauer (USP 6,355,217).

Claim 10 is drawn to a method for trapping a micro-crystal in a loop using the surface tension of liquid surrounding the micro-crystal. In claim 10, the first recited step is "placing on a base a liquid droplet in which micro-crystals are dispersed, said droplet having a dome-shaped surface due to the surface tension of the droplet." Neither Tanikawa nor Kiefersauer teaches or even suggests this step.

Claim 10 further recites: "inserting a gripping member into the droplet; gripping one of the micro-crystals in the droplet by the gripping member; inserting a loop into the droplet and positioning the loop to place the micro-crystal substantially inside the loop while the micro-crystal is gripped by the gripping member and immobilized relative to the gripping member, said loop being small enough to retain liquid of the droplet therein by filling the loop with the liquid using its surface tension when separated from the droplet but being large enough to receive inside the loop a tip of the gripping member with the micro-crystal gripped by the gripping member." Neither Tanikawa nor Kiefersauer teaches or suggests inserting and using their devices in liquid. The Office Action states: "It is interpreted by the examiner that the gripping means [of Tanikawa] are able to be inserted into a droplet to manipulate an object such as a crystal for examination." *Office Action* at page 4, lines 13-15. However, the speculated ability of Tanikawa's gripping means cannot support a finding of obviousness of the method as defined in claim 10, since Tanikawa in no way teaches inserting the gripping means into a liquid droplet and using it in combination with the loop in the liquid droplet as defined in claim 10. There is no motivation or reason to use a loop in combination with the

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gripping means in Tanikawa. The Office Action further states: "It is interpreted by the examiner that if the capillary [of Kiefersauer] may be adapted to mount particles, the loop [of Kiefersauer] may also be adapted to change to properly trap crystals of different sizes by inserting the loop into the droplet for capturing the microcrystal once the top layer of the droplet is removed and place where particles are examined and crystals are extracted from the droplet are placed upon a surface that is a base for examination where it can be displayed and observed." *Office Action* at page 5, lines 3-8. However, the speculated ability of Kiefersauer's capillary and loop cannot support a finding of obviousness of the method as defined in claim 10, since Kiefersauer in no way teaches inserting the loop into a liquid droplet and cooperating it with the gripping member particularly inside the liquid droplet as defined in claim 10. Further, Kiefersauer states: "It is generally known that protein crystals can be analyzed in a sealed capillary in the presence of free solvent to achieve adequate stability during structural analysis. A virtually saturated solvent atmosphere forms in the capillary, which prevents the crystallites from desiccating or drying." *Kiefersauer* at col. 1, lines 24-28. It is clear that Kiefersauer's device is for holding samples for analysis, not for capturing samples in a droplet. The gas channel 86a and the outlet 86b of Kiefersauer's device interfere with capturing of a sample dispersed in a droplet. Furthermore, Kiefersauer provides absolutely no indication that "said loop being small enough to retain liquid of the droplet therein by filling the loop with the liquid using its surface tension when separated from the droplet but being large enough to receive inside the loop a tip of the gripping member with the micro-crystal gripped by the gripping member" as defined in claim 10.

Claim 10 further recites: "separating simultaneously the loop and the gripping member together from the droplet while substantially maintaining the position of the micro-crystal relative to the gripping member and the loop, so that the crystal is held inside the loop filled with liquid of the droplet surrounding the crystal by the surface tension of the liquid." Neither Tanikawa nor Kiefersauer teaches or suggests the above particular step in which the loop and the gripping member are simultaneously separated from the droplet. Both Tanikawa and Kiefersauer are absolutely silent as to the capturing of a crystal using the surface tension of the liquid surrounding the crystal.

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Applicant has distinguished the currently claimed method from the prior art and believes that the method is beyond what was known to the art. Even if Tanikawa and Kiefersauer are combined, the combination could not lead one of ordinary skill in the art to perform the steps defined in claim 10, and therefore claim 10 could not be *prima facie* obvious over Tanikawa and Kiefersauer. Claim 11 and 18-21 also could not be obvious at least due to their dependencies upon claim 10.

It is respectfully requested that the rejection be withdrawn.

Rejections of Claims 18-19 Under 35 U.S.C. § 103

Claims 18-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanikawa and in view of Kiefersauer.

It is respectfully requested that the rejections of claims 18-19 be withdrawn at least due to their dependencies upon claim 10 in view of the above discussion in relation to claim 10.

Rejections of Claims 20-21 Under 35 U.S.C. § 103

Claims 20-21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanikawa and in view of Kiefersauer.

It is respectfully requested that the rejections of claims 20-21 be withdrawn at least due to their dependencies upon claim 10 in view of the above discussion in relation to claim 10.

Response to Arguments

The Office Action states: "Nowhere in the instant claims does it mention that placing the loop around the micro-crystal will cause it to enter the droplet by affecting the surface tension of the droplet." *Office Action* at page 2, paragraph 2, lines 4-6. Although the statement appears to be unclear to Applicant, claim 10 has been amended to define: "said droplet having a dome-shaped surface due to the surface tension of the droplet" and "the loop being small enough to retain liquid of the droplet therein by filling the loop with the liquid using its surface tension when separated from the droplet but being large enough to receive inside the loop a tip of the gripping member and the micro-crystal

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gripped by the gripping member." Because the droplet, the micro-crystal dispersed in the droplet, the loop, and the gripping member are all so small, the effect of the surface tension of the liquid and its viscosity is significant.

In claim 10, the tip of the gripping member is smaller than the loop as defined therein, and thus the tip of the gripping member causes less resistance and disturbance inside the droplet than does the loop when approaching the micro-crystal inside the droplet so that it is easier for the gripping member to approach and grip the micro-crystal than for the loop to approach and capture the micro-crystal inside the loop. These micro-phenomena and associated problems are not mentioned in the prior art of record.

The Office Action also states: "It is not claimed in the instant claims that the micro-crystal will remain immobile upon insertion of the loop or gripping member for capture." *Office Action* at page 2, paragraph 2, lines 8-10. Claim 10 has been amended to clarify the step which is "inserting a loop into the droplet and positioning the loop to place the micro-crystal substantially inside the loop while the micro-crystal is gripped by the gripping member and immobilized relative to the gripping member."

The Office Action further states: "Furthermore, the applicant asserts that upon separating the loop from the droplet, the loop often loses the micro-crystal capture and the gripping means alone is not sufficient to overcome the surface tension and keep the micro-crystal gripped when being separated from the droplet. The examiner questions whether this is an actual limitation of the method or if this is a property of the material of the loop and gripping or skill in the user or robot and the force or torque used when gripping the micro-crystal from the droplet." *Office Action* at page 2, the second to last line to page 3, line 5. The above Applicant mentioned problems reside in the nature of method or process. As discussed above, because the droplet, the micro-crystal contained in the droplet, the loop, and the gripping member are all so small as defined in claim 10, the effect of the surface tension of the liquid and its viscosity is significant. The loop alone can capture the micro-crystal inside the loop due to the surface tension of the liquid containing the micro-crystal. However, because the loop is so small, when breaking the surface tension of the droplet to move out of the droplet, the liquid together with the micro-crystal inside the loop may be taken away from the loop by the droplet.

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On the other hand, the gripping member can physically grip the micro-crystal. However, the tip of the gripping member is smaller than the loop as defined in claim 10, and thus receives more effect of the surface tension of the droplet than does the loop when breaking the surface tension of the droplet to move out of the droplet. Further, in order to avoid crushing or damaging the micro-crystal, the gripping member cannot grip the micro-crystal tightly. By cooperating the loop and the gripping member in the way as defined in claim 10, it becomes possible to keep the micro-crystal captured in the loop when being separated from the droplet. Incidentally, because the crystal needs to be captured in the loop, use of the gripping member alone is not practical.

In contrast, in claim 10, by "separating simultaneously the loop and the gripping member together from the droplet while substantially maintaining the position of the micro-crystal relative to the gripping member and the loop," the crystal can surprisingly effectively be held inside the loop filled with liquid of the droplet surrounding the crystal by the surface tension of the liquid.

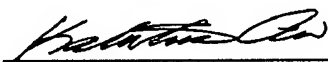
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CONCLUSION

In light of the Applicant's amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. The grounds for rejection which are not discussed herein are moot and Applicants expressly do not acquiesce in the findings not separately addressed. Any alterations or characterizations made to the application or claims are being made to facilitate expeditious prosecution of this application, rather than conceding that previously pending claims are not patentable over the cited references. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

Dated: December 31, 2008

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